AMENDMENTS TO THE CLAIMS

1-121. (Canceled)

122. (Previously Presented) A method for processing data from a glucose sensor, comprising:

monitoring a data stream indicative of an output current from a glucose sensor;

detecting transient non-glucose related signal artifacts in the data stream and evaluating a severity thereof based at least in part on a frequency content of the transient non-glucose related signal artifacts; and

replacing with an electronic device at least some of the signal artifacts with one or more estimated glucose values.

123-191. (Canceled)

192. (Previously Presented) The method of claim 122, wherein replacing transient non-glucose related signal artifacts further comprises selectively applying one of a plurality of signal estimation algorithm factors in response to the severity of the signal artifacts.

193. (Previously Presented) The method of claim 192, wherein the plurality of signal estimation algorithm factors comprises a single algorithm with a plurality of parameters that are selectively applied to the algorithm.

194. (Previously Presented) The method of claim 192, wherein the plurality of signal estimation algorithm factors comprises a plurality of distinct algorithms.

195. (Previously Presented) The method of claim 192, wherein selectively applying one of a plurality of signal estimation algorithm factors comprises selectively applying a predetermined algorithm that comprises a set of parameters whose values depend on the severity of the signal artifacts.

196. (Previously Presented) The method of claim 122, wherein replacing at least some of the signal artifacts with one or more estimated glucose values comprises outputting data representative of the one or more estimated glucose values, wherein the data comprises at least one of a numeric representation of the one or more estimated glucose values, an indication of directional trend of the one or more estimated glucose values, or a graphical representation of the one or more estimated glucose values.

197. (Previously Presented) The method of claim 196, further comprising filtering the data stream, wherein the one or more estimated glucose values are based on the filtered data stream.

198. (Previously Presented) The method of claim 196, wherein the one or more estimated glucose values are based on an unfiltered data stream.

199. (Previously Presented) The method of claim 122, wherein monitoring a data stream comprises receiving data from at least one of a non-invasive, a minimally invasive, or an invasive glucose sensor.

200. (Previously Presented) The method of claim 122, wherein monitoring a data stream comprises receiving data from at least one of an enzymatic glucose sensor, a chemical glucose sensor, a physical glucose sensor, an electrochemical glucose sensor, a spectrophotometric glucose sensor, a polarimetric glucose sensor, a calorimetric glucose sensor, an iontophoretic glucose sensor, or a radiometric glucose sensor.

201. (Previously Presented) The method of claim 122, wherein detecting transient non-glucose related signal artifacts further comprises at least one of: testing for ischemia within or proximal to the glucose sensor; monitoring a level of pH proximal to the sensor; monitoring a temperature proximal to the sensor; comparing a level of pH proximal to and distal to the sensor; comparing a temperature proximal to and distal to the sensor; monitoring a pressure or stress within the glucose sensor; evaluating historical data for high amplitude noise above a predetermined threshold; performing a Cone of Possibility Detection Method; evaluating the data stream for a non-physiological rate-of-change; performing an orthogonal basis function-based transform; performing a Fourier Transform; or performing a wavelet transform.

202. (Previously Presented) The method of claim 122, wherein replacing at least some of the signal artifacts comprises at least one of: performing linear or non-linear regression; performing a trimmed mean; filtering using a non-recursive filter; filtering using a finite impulse response filter; filtering using a recursive filter; filtering using an infinite impulse response filter; performing a maximum average algorithm; or performing a Cone of Possibility Replacement Method.

203. (Previously Presented) The method of claim 122, wherein replacing at least some of the signal artifacts is substantially continual.

204. (Previously Presented) The method of claim 122, wherein replacing at least some of the signal artifacts is initiated when the severity of signal artifacts meets a criterion.

205. (Previously Presented) The method of claim 122 wherein replacing at least some of the signal artifacts is terminated when the severity of signal artifacts meets a criterion.

206. (Previously Presented) The method of claim 122, further comprising discarding at least some of the signal artifacts.

207. (Previously Presented) The method of claim 122, further comprising calibrating the data stream.

208-269. (Canceled)

270. (Previously Presented) The method of claim 122, wherein replacing at least some of the signal artifacts with one or more estimated glucose values comprises outputting or displaying the one or more estimated glucose values.

271. (Previously Presented) The method of claim 122, further comprising filtering the monitored data stream.

272. (Previously Presented) The method of claim 122, wherein the data stream comprises a filtered data stream.

273. (Previously Presented) The method of claim 122, wherein the data stream comprises a raw data stream.

274. (Previously Presented) The method of claim 122, wherein the frequency content comprises frequencies contained within the data stream.

275. (Previously Presented) The method of claim 122, wherein evaluating the severity of signal artifacts based at least in part on a frequency content of the transient non-glucose related signal artifacts comprises detecting high frequency constituents of the data stream.

276. (Previously Presented) The method of claim 122, further comprising outputting the one or more estimated glucose values.

277. (Previously Presented) The method of claim 122, further comprising outputting the data stream.

278. (Previously Presented) The method of claim 122, further comprising evaluating whether the one or more estimated glucose values is outside a predetermined range,

wherein the predetermined range is defined by boundaries derived from a projected rate of change and/or acceleration of estimated glucose values.

279. (Previously Presented) The method of claim 278, further comprising discarding the one or more estimated glucose values if the one or more estimated glucose values is outside the predetermined range.

280. (Previously Presented) The method of claim 278, further comprising replacing the one or more estimated glucose values with a predetermined limit value if the one or more estimated glucose values is outside the predetermined range.

281. (Previously Presented) The method of claim 122, further comprising storing the one or more estimated glucose values.

282. (Previously Presented) The method of claim 122, further comprising displaying the one or more estimated glucose values.

283. (Previously Presented) The method of claim 122, wherein replacing at least some of the signal artifacts with one or more estimated glucose values comprises a maximum-average calculation.

284. (Previously Presented) The method of claim 283, wherein the maximum-average calculation comprises selecting a maximum value from the data stream for an interval and averaging the maximum value associated with the interval with at least one maximum value associated with at least one previous interval.

285. (Previously Presented) The method of claim 284, wherein the interval comprises a time period.

286. (Previously Presented) The method of claim 122, wherein replacing at least some of the signal artifacts comprises determining whether the ratio of the one or more estimated glucose values to at least one projected value is outside a predetermined ratio range, and replacing the one or more estimated glucose values with the at least one projected value if the ratio is outside a predetermined ratio range.

287. (Previously Presented) The method of claim 122, further comprising using a time series analysis based on a variance of a signal over a window of data.

288. (Previously Presented) The method of claim 287, wherein the window of data is about 15 minutes.

389. (Previously Presented) The method of claim 287, wherein the window of data is about 30 minutes.

290. (Previously Presented) The method of claim 287, wherein the window of data is about 45 minutes.

291. (Previously Presented) The method of claim 287, wherein the window of data is about 60 minutes.

292. (Canceled)

293. (Previously Presented) The method of claim 122, wherein evaluating a severity of signal artifacts based at least in part on the frequency content comprises detecting high frequency cycles.

294-331. (Canceled)

332. (Previously Presented) The method of claim 122, further comprising using amperometry to generate a signal response from the glucose sensor.

333. (Previously Presented) The method of claim 332, further comprising transforming the signal response into the data stream, wherein the data stream represents digitized measurement values directly related to the signal response.

334. (Previously Presented) The method of claim 122, further comprising generating the data stream, wherein generating the data stream comprises:

applying a voltage potential to an electrode of the glucose sensor; and

measuring the output current of the electrode.

335. (Previously Presented) The method of claim 334, wherein generating the data stream further comprises digitizing the output current measurement.

336. (Previously Presented) The method of claim 334, wherein generating the data stream further comprises converting the output current into digital counts, wherein the data stream comprises information representative of the counts, and wherein the counts are directly related to the measured output current.

337. (Previously Presented) The method of claim 122, wherein detecting further includes converting data represented in the data stream using an orthogonal basis function-based transform.

338. (Previously Presented) The method of claim 337, wherein the orthogonal basis function-based transform is a transform selected from the group consisting of a Fourier Transform, a Discrete Fourier Transform and a wavelet transform.

339. (Previously Presented) The method of claim 337, wherein the orthogonal basis function-based transform is a windowed Discrete Fourier Transform, and wherein evaluating a severity comprises identifying frequency cycles in the converted data that exceed a predetermined threshold.

340. (Previously Presented) The method of claim 122, further comprising identifying a transient non-glucose related signal artifact associated with signal loss based on the evaluation, and wherein replacing comprises replacing the transient non-glucose related signal artifact associated with a signal loss with an estimated glucose value.

341. (Previously Presented) The method of claim 122, further comprising monitoring the frequency content to identify high frequency cycles, wherein signal artifacts associated with identified high frequency cycles are replaced with estimated glucose values.

342. (Previously Presented) The method of claim 122, wherein detecting further comprises converting the transient non-glucose related signal artifacts by applying a windowed Discrete Fourier Transform, and wherein evaluating a severity includes comparing the converted transient non-glucose related signal artifacts to a threshold.